

Claims:

1. (Original) A method comprising:
receiving image data; and
executing an averaging instruction to average a plurality of pixels of the
image data;
wherein executing the averaging instruction generates a set of four-pixel
averages, each four-pixel average generated from two pixels in a
first source register and two pixels in a second source register;
and
wherein executing the averaging instruction comprises:
adding successive pixels from the first source register to
successive pixels of the second source register generating
a plurality of intermediate results; and
adding two of the plurality of intermediate results and repeating
with different combinations of the plurality of intermediate
results generating a plurality of sum results.
2. (Original) The method as recited in Claim 1, wherein the two pixels
in the first source register and the two pixels in the second source register are
adjacent pixels in an image.
3. (Original) The method as recited in Claim 2, wherein the adjacent
pixels are adjacent in both horizontal and vertical dimensions.

4. (Original) The method as recited in Claim 1, wherein the executing the averaging instruction further comprises:

discarding the two least significant bits of each sum result of the plurality of sum results generating the set of four-pixel averages.

5. (Original) The method as recited in Claim 1, wherein the first source register comprises a plurality of pixels from a first row of pixels and the second source register comprises a plurality of pixels from a second row of pixels, and wherein the first row is adjacent to the second row in an image.

6. (Original) The method as recited in Claim 5, further comprising:
repeating the executing the averaging instruction for all pixels in the image; and

discarding a portion of generated four-pixel averages, generating a down-scaled image.

7. (Original) The method as recited in Claim 6, wherein the discarding the portion of the generated four-pixel averages comprises:

masking every other four-pixel average using a AND operation;
executing a pack instruction that compresses two eight element registers into a single eight element register generating the down scaled image.

8. (Original) The method as recited in Claim 1, wherein the set of four-pixel averages comprise interpolated pixel values utilized for video coding.

9. (Original) The method as recited in Claim 8, wherein the video coding is a motion estimation encoding.
10. (Original) The method as recited in Claim 8, wherein the video coding is a motion compensation decoding.
11. (Original) The method as recited in Claim 1, wherein the set of four-pixel averages are utilized for image color space conversion.
12. (Original) The method as recited in Claim 1, wherein the set of four-pixel averages are utilized for image color format conversion.
13. (Original) The method as recited in Claim 1, wherein the first source register comprises a plurality of pixels from a first row of pixels and the second source register comprises a plurality of pixels from a second row of pixels, and wherein the first row is from a different image than the second row.
14. (Original) The method as recited in Claim 13, wherein the set of four-pixel averages comprise averaged pixel values utilized for motion estimation video encoding.
15. (Original) The method as recited in Claim 13, wherein the set of four-pixel averages comprise averaged pixel values utilized for motion compensation video decoding.
16. (Original) The method as recited in Claim 1, wherein the averaging instruction is a Single-Instruction/Multiple-Data (SIMD) instruction.

17. (Original) The method as recited in Claim 1, wherein the first source register comprises a plurality of pixels from a row of pixels and the second source register comprises another plurality of pixels from the row of pixels, and wherein each pixel of the plurality of pixels is adjacent in an image to at least one pixel of the another plurality of pixels.

18. (Original) The method as recited in Claim 17, wherein the executing the averaging instruction comprises a portion of a separable filter implementation.

19. (Original) A system comprising:

an addressable memory to store an instruction for an averaging operation;

a processing core coupled to the addressable memory, the processor core comprising:

an execution core to access and execute the instruction;

a first source register to store a first plurality of pixels;

a second source register to store a second plurality of pixels; and

a destination register to store a plurality of results of the averaging operation;

a wireless interface to receive a digital signal comprising a third plurality of pixels; and

an I/O system to provide the first and second plurality of pixels to the

first and second source registers from the third plurality of pixels;

wherein to execute the instruction, the execution core is operative to:

generate a set of four-pixel averages, each four-pixel average generated from two pixels in the first source register and two pixels in the second source register.

20. (Original) The system as recited in Claim 19, wherein to generate the set of four-pixel averages the execution core is operative to:

add successive ones of the first plurality of pixels to successive ones of the second plurality of pixels generating a plurality of intermediate results;

add two of the plurality of intermediate results and repeating with different combinations of the plurality of intermediate results generating a plurality of sum results; and

discard the two least significant bits of each sum result of the plurality of sum results generating the set of four-pixel averages.

21. (Original) The system as recited in Claim 19, wherein the first source register comprises a plurality of pixels from a first row of pixels and the second source register comprises a plurality of pixels from a second row of pixels, and wherein the first row is adjacent to the second row in an image.

22. (Original) The system as recited in Claim 19, wherein the first source register comprises a plurality of pixels from a first row of pixels and the second source register comprises a plurality of pixels from a second row of pixels, and wherein the first row is from a different image than the second row.

23. (Original) The system as recited in Claim 19, wherein the first source register comprises a plurality of pixels from a row of pixels and the second source register comprises another plurality of pixels from the row of pixels, and wherein each pixel of the plurality of pixels is adjacent in an image to at least one pixel of the another plurality of pixels.

24. (Original) The system as recited in Claim 19, wherein the averaging instruction is a Single-Instruction/Multiple-Data (SIMD) instruction.

25. (Original) A system comprising:

an addressable memory to store an instruction for an averaging operation;

a processing core coupled to the addressable memory, the processor core comprising:

an execution core to access and execute the instruction;

a first source register to store a first plurality of pixels;

a second source register to store a second plurality of pixels; and

a destination register to store a plurality of results of the averaging operation;

a video capture interface to receive a digital signal comprising a third plurality of pixels; and

an I/O system to provide the first and second plurality of pixels to the

first and second source registers from the third plurality of pixels;

wherein to execute the instruction, the execution core is operative to:

generate a set of four-pixel averages, each four-pixel average generated from two pixels in the first source register and two pixels in the second source register.

26. (Original) The system as recited in Claim 25, wherein the first source register comprises a plurality of pixels from a first row of pixels and the second source register comprises a plurality of pixels from a second row of pixels, and wherein the first row is adjacent to the second row in an image.

27. (Original) The system as recited in Claim 25, wherein the first source register comprises a plurality of pixels from a first row of pixels and the second source register comprises a plurality of pixels from a second row of pixels, and wherein the first row is from a different image than the second row.

28. (Original) The system as recited in Claim 25, wherein the first source register comprises a plurality of pixels from a row of pixels and the second source register comprises another plurality of pixels from the row of pixels, and wherein each pixel of the plurality of pixels is adjacent in an image to at least one pixel of the another plurality of pixels.

29. (Original) The system as recited in Claim 25, wherein the instruction is a Single-Instruction/Multiple-Data (SIMD) instruction.

30. - 38. (Canceled)